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REMARKS

This paper is responsive to the Office Action dated May 6, 2005. Claims 1-8 and 33-48 were examined. Non-narrowing amendments have been made to claims 1 and 2. Claim 1 has been amended to cure an antecedent basis error and claim 2 has been amended to correct a typographical error. Claim 44 has been amended for clarification.

Rejection Under 35 U.S.C. §112

Claims 1, 4, 45 and 46 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 has been amended to cure an antecedent basis error. Claim 4 has not been amended since it satisfies §112, second paragraph. Claim 45 has been amended for clarity in response to the Examiner's charge of antecedent basis error. Claim 46 has not been amended, because there is antecedent basis for the terms protested by the Examiner. It should be clear that "code of the program that depends on the identified null pointer condition checks" provides sufficient antecedent basis for "null pointer condition check dependent program code." It should also be clear that "program code that handles null pointer conditions" provides sufficient antecedent basis for "null pointer condition handling program code."

Rejection Under 35 U.S.C. §101

Claims 44-48 are rejected under 35 U.S.C. §101 as being directed towards non-statutory subject matter. The Examiner protests language in the specification, but fails to examine the actual claim language of claim 44. Claim 44 recites "A computer program product encoded on one or more machine-readable media." The Examiner refers to a sentence in the specification that states "[a]dditionally, applications may be in the form of electronic signals modulated in accordance with the application and data communication technology when accessed via network modem 747 or interface 748." Neither the claim language nor the complete sentence in the specification (instead of the clause referred to by the Examiner) is non-statutory. Applicant requests that the §101 rejection of claim 44 be withdrawn since it is incorrect.

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Rejections Under 35 U.S.C. §103

Claims 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, and 33 – 48 are rejected under 35 U.S.C. §103(a) as being unpatentable over "*Optimizing Away C++ Exception Handling*" by Schilling (hereinafter "Schilling") in view of "*Effective Null Pointer Check Elimination Utilizing Hardware Trap*" by Kawahito et al. (hereinafter "Kawahito") and further in view of U.S. Patent No. 6,189,141 issued to Benitez et al. (hereinafter "Benitez"). The Examiner has merely pasted in the rejection from the previous Office Action as evidenced by the rejection of claims 9, 11, 13, 15, 17, 19, 21, and 23, which were cancelled in the response filed 17 February 2005. Although not listed initially, claims 2, 4, 6, and 8 are also rejected under 35 U.S.C. §103(a) as being unpatentable over Schilling in view of Kawahito, and further in view of Benitez. Applicant traverses these rejections at least because 1) none of the art of record discloses conditional creation of a fault to target translation table; and 2) the combination of the references and modification of Benitez is only supported by the Examiner's assumptions and hindsight with Applicant's disclosure.

Failure to disclose creating a fault to target translation table contingent upon null pointer condition check encountering null conditions infrequently

None of the art of record discloses conditional creation of a table. Claim 1 recites "creating a fault to target translation table of the null pointer condition check **if the null pointer condition check infrequently encounters null pointer conditions.**" None of the references relied upon by the Examiner, standing alone or in combination, disclose or suggest creation of a fault to target translation table of the null pointer condition check being contingent upon frequency of the null pointer condition check encountering null pointer conditions. In fact, Schilling specifically states that "the table-driven approach consists of building logically read-only, **static tables** at compile and link time...." There is no disclosure or suggestion in any of the art of record to create a fault to target translation table for a null pointer condition check if the check infrequently encounters null pointer conditions.

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Unsupported modification and combination of references

The Examiner assembles together an exception handling table from Schilling, conversion of null pointer tests from Kawahito, and hot tracing from Benitez, and adds unsupported assumptions about obviousness in an attempt to achieve Applicant's claims. The rationale proffered by the Examiner for this combination of pieces from various references is optimization. The Examiner begins by proclaiming the obviousness of using the exception handling table of Schilling to handle the zero page exceptions disclosed in Kawahito. Then, the Examiner manipulates Benitez to conjure a non-null pointer trace. The Court in Ruiz v. A.B. Chance Co., 357 F.3d 1270, 69 USPQ2d 1686 (Fed. Cir. 2004) provided guidance as follows:

> In making the assessment of differences, section 103 specifically requires consideration of the claimed invention "as a whole." Inventions typically are new combinations of existing principles or features. Envtl. Designs, Ltd. v. Union Oil Co., 713 F.2d 693, 698 (Fed. Cir. 1983) (noting that "virtually all [inventions] are combinations of old elements."). The "as a whole" instruction in title 35 prevents evaluation of the invention part by part. Without this important requirement, an obviousness assessment might break an invention into its component parts (A + B + C), then find a prior art reference containing A, another containing B, and another containing C, and on that basis alone declare the invention obvious. This form of hindsight reasoning, using the invention as a roadmap to find its prior art components, would discount the value of combining various existing features or principles in a new way to achieve a new result - often the very definition of invention.
>
> Section 103 precludes this hindsight discounting of the value of new combinations by requiring assessment of the invention as a whole. This court has provided further assurance of an "as a whole" assessment of the invention under § 103 by requiring a showing that an artisan of ordinary skill in the art at the time of invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would select the various elements from the prior art and combine them in the claimed manner. In other words, the examiner or court must show some suggestion or motivation, before the invention itself, to make the new combination. See In re Rouffet, 149 F.3d 1350, 1355-56 (Fed. Cir. 1998).

Benitez discloses a hot trace identifier that identifies as a hot block a block of instructions with a block starting instruction that has an execution frequency greater than or equal to an

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execution threshold. The block is then instrumented to record control flow. If the control flow rate through the hot block is greater than a threshold, then it is selected for possible optimization. As stated in the previous response, Benitez may be used to determine that a null pointer condition check is executed 1000 times, but does not indicates how many of those executions encountered a null condition. In response, the Examiner states that Benitez would "be used to monitor the path taken as a result of the null pointer condition check...and that this would provide an indication of the frequency of null pointer conditions." Applicant requests for the Examiner to identify support in Benitez for the Examiner's statement. Claim 2 recites "gathering statistics as to the number of null pointer condition occurrences the null pointer condition check encounters." Although Benitez gathers statistics for frequency of execution of a trace of instructions, there is no disclosure or suggestion in Benitez for the quoted limitation of claim 2 and there is no support for any assumptions as to obviousness of gathering statistics about frequency of null condition occurrences.

Furthermore, the Office does not even attempt to indicate disclosure or suggestion of the other limitations of claim 2. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). The Office does not even attempt to satisfy this requirement.

To reject claims 33-48, the Office goes further and proclaims that Benitez **inherently** "discloses optimizing code when a complimentary condition occurs less frequently than the given threshold." Hence, to reject claims 33 – 48, the Office contorts Benitez's disclosure of a hot trace identifier that identifies blocks that execute more than a given threshold into a hot trace identifier that monitors the frequency that a null pointer condition check encounters null pointer conditions, regardless of the complete absence of any support for such contortion, and then relies on an unsupported assertion of inherency. "The fact that a certain result or characteristic **may** occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic." MPEP §2112 (IV), *citing* In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic **necessarily** flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). Applicant

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requests that the Examiner identify support for the assertion of inherency, especially in light of Benitez's disclosure that "[i]f control flow has changed during execution, such that the amount of rate of control flow through a hot trace falls below a threshold value, the trace may be removed" (Abstract). Without the guidance from Applicant's specification, the combination and modification of the art of record, fails to disclose or suggest "selectively eliminating from code null pointer condition checks that encounter null pointer conditions less frequently than a given threshold according to profile feedback for the code" as recited in claim 33, and similarly in claim 41. Also, none of the art of record discloses or suggests "a first sequence of instructions executable to identify those null pointer condition checks of a program that encounter null conditions less frequently than a threshold according to profile feedback for the program" as recited in claim 44, and similarly in claims 34 and 36. As stated above, Benitez does not disclose or suggest measuring frequency that a null pointer condition check encounters null conditions.

With regard to claims 35, 43, and 48, none of the art of record discloses or suggests extracting information about null pointer condition frequencies from profile feedback. The Examiner again relies on Benitez's disclosure of measuring control passing through an arc. None of the art of record can disclose or suggest extracting such information because, as stated above, none of the art of record discloses or suggests gathering such information about null pointer condition frequencies.

In summary, claims 1 – 3, 5 – 8 and 33 – 48 are in the case. All claims are believed to be allowable over the art of record, and a Notice of Allowance to that effect is respectfully solicited. Nonetheless, if any issues remain that could be more efficiently handled by telephone, the Examiner is requested to call the undersigned at the number listed below.

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